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STOP KICKING THE CAN DOWN THE ROAD: AN URGENT CALL TO SAVE THE UNITED STATES FROM NUCLEAR DISPOSAL

“We have a moral and national security obligation to come up with a long-term solution, finding the safest repositories available . . . we can no longer kick the can down the road.”

-Rick Perry, United States Secretary of Energy¹

I. INTRODUCTION

The year is 2040. The United States has implemented evacuation drills for high-risk areas surrounded by nuclear waste. The students of Suncrest Middle School are accustomed to, and even excited about, their monthly evacuation drills cancelling class for the day. As the parents drop their children off today, they have no idea it will be their last moment together. Today is not a drill. The nearby stored nuclear waste has overflowed, and the students will not make it.

The United States stands on the brink of a nuclear crisis. When most Americans hear “nuclear crisis,” they immediately assume foreign nuclear attack. In reality, the United States has created a nuclear waste² field throughout the country that proves just as dangerous as any potential nuclear war. Sixty-one commercial nuclear power plants operate in the United States with two more currently under construction.³ Since the emergence of nuclear energy as a clean energy resource in the 1950s, these sixty-one plants in the United States have produced over 80,000 metric tons of nuclear waste.⁴

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1. Jeremy Dillon, *Yucca Mountain compromise bill advanced by Energy and Commerce Committee*, CQ Roll Call, 2017 WL 2786391.

2. Much of the nuclear waste produced is radioactive and, therefore, must be carefully managed as hazardous material. Radioactive waste includes any material that is either intrinsically radioactive or contaminated by radioactivity, and that is deemed to have no further use. *Nuclear Waste Management*, WORLD NUCLEAR ASSOCIATION (Apr. 2018), <https://perma.cc/F938-7APS>.

3. *How many Nuclear Power Plants Are in the United States, and Where are They Located?*, *Frequently Asked Questions*, U.S. ENERGY INFO. ADMIN. (Aug. 15, 2017), <https://perma.cc/3VX6-3UD2>.

4. Nuclear energy generates heat from fission producing no greenhouse gases or emissions associated with acid rain or urban smog. Using more nuclear energy gives states additional flexibility in complying with clean air requirements. *Protecting the Environment*, NUCLEAR ENERGY INST., <https://perma.cc/75ND->

The United States Government continues to grapple with how to handle this mounting problem.⁵ Congress attempted to tackle the waste issue with the enactment of the Nuclear Waste Policy Act (NWPA) in 1982, which launched the search for a permanent geologic nuclear waste repository.⁶ In 1987, Congress amended the NWPA, designating Yucca Mountain, located ninety miles northwest of Las Vegas, as the sole candidate for a repository.⁷ The designation of Yucca Mountain has provoked much backlash from Nevada residents and politicians since its selection as the permanent site decades ago.⁸ Battling factions have caused the nuclear waste dilemma to remain unsolved. With nuclear waste piling up in America's backyard, Congress must act now to save America from its own nuclear destruction.

The current federal nuclear power plant waste disposal process relies on alternative methods to deal with nuclear waste. Under the Federal Nuclear Waste Policy Act of 1982, the federal government is responsible

3FBB (last visited Sept. 17, 2017); *U.S. Gov't Accountability Office, GAO-17-340, Commercial Nuclear Waste: Resuming Licensing of the Yucca Mountain Repository Would Require Rebuilding Capacity at DOE and NRC, Among Other Key Steps*, U.S. GOVERNMENT ACCOUNTABILITY OFFICE (Apr. 26, 2017), <https://perma.cc/6AUU-RJQV>.

5. Charles de Saillan, *Disposal of Spent Nuclear Fuel in the United States and Europe: A Persistent Environmental Problem*, 34 HARV. ENVTL. L. REV. 461, 485 (2011).

6. Alex Funk and Benjamin Sovacool, *Wasted Opportunities: Resolving the impasse in United States Nuclear Waste Policy*, 34 ENERGY L.J. 113, 115 (2013); See 42 U.S.C. §§ 10101(18) (defining "repository"), 10131(b)(2) (establishing federal responsibility for high-level radioactive waste and spent nuclear fuel), 10222(a)(5)(B) ("[B]eginning not later than January 31, 1998, [the Secretary] will dispose of the high-level radioactive waste or spent nuclear fuel . . ."); Robert Vandenbosch & Susanne E. Vandenbosch, *Nuclear Waste Stalemate: Political and Scientific Controversies* 60 (2007). "While a geologic repository may take many forms, in layman's terms, the geologic repository envisioned by the NWPA is essentially a natural rock storage zone into which cylindrical containers of radioactive waste will be inserted and buried." See Megan Easley, *Standing in Nuclear Waste: Challenging the Disposal of Yucca Mountain*, 97 CORNELL L. REV. 659, 661 (2012); See also David Bodansky, *Nuclear Energy: Principles, Practices, and Prospects* 266-67 (2d ed. 2004).

7. Funk and Sovacool, *supra* note 6, at 116.

8. See Marta Adams, *Yucca Mountain—Nevada's Perspective*, 46 IDAHO L. REV. 423 (2010); See also Gary Martin, *Yucca Mountain opposition to be focus at Las Vegas conference*, LAS VEGAS REVIEW JOURNAL (Sept. 5, 2017), <https://perma.cc/FD4N-9KL5>.

for management of Spent Nuclear Fuel (SNF)⁹ from fuel processing described by the Nuclear Regulatory Commission (NRC).¹⁰ Congress can and should amend the Nuclear Waste Policy Act to allow private companies to construct and operate large interim storage facilities for commercial nuclear use, granted the Energy Department also assumes liability for the waste.¹¹ By allowing private companies to create large interim storage facilities, Congress gains more time to find a permanent repository and tackle the nation's nuclear waste problem.

Considering the massive amount of taxpayer dollars invested in Yucca Mountain, Congress needs independent regulators to determine whether the site passes all safety and environmental screenings before completely deciding against the location. If the independent regulators deem Yucca Mountain unfit to house the nation's nuclear waste, the United States should abandon the project and search for an alternative permanent repository.

Given that an agreement seems unlikely, the United States cannot wait for the government to decide on the viability of Yucca Mountain before allowing consolidated interim storage facilities, because an agreement seems unlikely. An alternative avenue the United States should take with regards to spent nuclear fuel is reprocessing.¹² Of course, a major drawback of fuel reprocessing, and the reason the U.S. is hesitant to consider it, stems from weapons proliferation.¹³ Although weapons proliferation worries many Americans, France has used fuel reprocessing

9. Spent Nuclear Fuel is composed of highly radioactive nuclear by-products, some of which have half-lives spanning thousands of years. Emily Casey, *Waist-Deep in Nuclear Waste: How the NRC Can Rebuild Confidence in a Stalled Waste Management Program*, 33 J. NAT'L ASS'N ADMIN. L. JUDICIARY 723, 727 (2013).

10. Pub. L. No. 97-425, 96 Stat. 2205 (1983), codified in 42 U.S.C.A. §§ 10101-10270; 42 U.S.C.A. § 10131.

11. Daniel Bloom, *Texas Firm applies for nuclear waste license, hopes to spur Congress to Act*, CQ ROLL CALL, 2016 WL 1711494.

12. "Reprocessing is a series of chemical operations that separates plutonium and uranium from other nuclear waste contained in the used (or "spent") fuel from nuclear power reactors. The separated plutonium can be used to fuel reactors." *Nuclear Reprocessing: Dangerous, Dirty, and Expensive*, UNION OF CONCERNED SCIENTISTS, <https://perma.cc/Q3ZZ-VQSN> (last visited Nov. 12, 2017).

13. Richard Burleson Stewart & Jane Bloom Stewart, *Fuel Cycle to Nowhere: U.S. Law and Policy on Nuclear Waste*, VANDERBILT UNIV. PRESS 19, 46 (2012).

without major issues, supporting the idea that the United States should follow France's lead to implement fuel reprocessing.¹⁴

Part I of this Comment illustrates why and how the NWPA must be amended to solve the nation's growing nuclear waste crisis. Part II will introduce the history and legal background of nuclear waste disposal, focusing on Yucca Mountain and the NWPA. This part will review the crisis over the years, explaining how it has progressed to the present-day. Part III will discuss the NWPA and the current private companies seeking nuclear waste licenses. Additionally, this part will focus on the 2017 Yucca Mountain compromise bill to demonstrate the importance of allowing private companies to open interim waste facilities. Part IV will address the liability of private facilities and whether the Price Anderson Act should apply to private interim facilities. Finally, Part V will evaluate the necessity of revamping the U.S. nuclear waste reprocessing program and the possibility of following in the footsteps of countries such as France that have paved the way in nuclear reprocessing.

II. THE DAWN OF NUCLEAR WASTE DISPOSAL

The history of the United States' nuclear energy crisis spans back to the 1950s when nuclear energy first emerged as an alternative energy source to fossil fuels. While this new source provided a clean alternative to fossil fuels, a new concern surfaced: uncertainty over proper storage and disposal of waste produced by nuclear energy. The Nuclear Waste Policy Act of 1985 attempted to answer the problem with the selection of Yucca Mountain as a permanent repository for the nuclear waste. Since the emergence of the nuclear waste storage problem, the federal government has spent over thirty years attempting to reach a solution, and the Yucca Mountain repository has yet to be constructed.

A. *The Early Years of Nuclear Energy*

With the advent of nuclear energy as a clean source of electric power in the 1950s, the Atomic Energy Act (AEA) of 1954 primarily concentrated on the development of nuclear energy in a safe manner.¹⁵ Congress amended the AEA in 1959 to clarify that the federal government

14. Emily Farah, *Reviving Spent Nuclear Fuel Reprocessing in the U.S.*, 16 U. PITT. J. TECH. L. & POL'Y 183, 184 (2016).

15. Steven Melzer, *Nuclear Stalemate: Indefinite Above-Ground Storage is a temporary, Albeit Safe Band-Aid for a Serious Wound*, 91 NOTRE DAME L. REV. 847, 849 (2015).

had the sole authority to regulate nuclear power.¹⁶ The United States Legislature passed the Energy Reorganization Act of 1974, creating the Nuclear Regulatory Committee (NRC), and charging it with the management of reactor facilities. These facilities created nuclear energy.¹⁷ Federal law expressly prohibits the NRC from ceding or sharing its regulatory authority over matters such as the construction and operations of facilities, the export and import of nuclear material, and the disposal of nuclear materials.¹⁸

Five years after the creation of the NRC, the first major nuclear catastrophe, The Three Mile Island, occurred in the United States, catalyzing the public's fear of nuclear power. The Three Mile Island transpired in 1979 near Middletown, Pennsylvania, where a reactor melted down and released radioactive material.¹⁹ Although there were no detectable health effects from the incident, it stoked fear in the United States over nuclear proliferation.²⁰ While incidents like The Three Mile Island Incident remain a concern, the NRC's focus has shifted away from reactor operation risks and toward the more pressing issue of dealing with the massive amount of spent fuel and radioactive waste piling up at facilities across the nation.²¹

B. The Nuclear Waste Policy Act and Yucca Mountain

In 1982, Congress passed the NWPA²² to address the issue of waste disposal.²³ The NWPA provided the framework for selecting a permanent geologic repository to store the country's nuclear waste.²⁴ The Department

16. 42 U.S.C.A. § 2021 (1962).

17. NRC began operation in 1975. Steven Melzer, *Nuclear Stalemate: Indefinite Above-Ground Storage is a temporary, Albeit Safe Band-Aid for a Serious Wound*, 91 NOTRE DAME L. REV. 847, 850 (2015); Melzer, *supra* note 15, at 850.

18. 42 U.S.C.A. § 2021(c) (2004).

19. *Background on the Three Mile Island Incident*, U.S. NUCLEAR REG. COMM'N (Dec. 12, 2014), <https://perma.cc/WW27-3JCC>.

20. *Id.* "Its aftermath brought about sweeping changes involving emergency response planning, reactor operator training, human factors engineering, radiation protection, and many other areas of nuclear power plant operations. It also caused the NRC to tighten and heighten its regulatory oversight. All of these changes significantly enhanced U.S. reactor safety."

21. Melzer, *supra* note 15, at 851.

22. Pub. L. No. 97-425, 96 STAT. 2205 (1983), codified in 42 U.S.C.A. §§ 10101-10270.

23. 42 U.S.C. § 10131(a)(2) (2012) ("[A] National problem has been created by the accumulation of [A] spent nuclear fuel from the nuclear reactors").

24. 42 U.S.C. § 10132.

of Energy (DOE) conducted a search for a permanent repository with a plan to present its findings to President Reagan.²⁵ The DOE provided three locations for the President to choose from: the Hanford Nuclear Reservation in Washington; a salt formation in Texas; and Yucca Mountain in Nevada.²⁶ Due to strong congressional clout held by Texas and Washington, along with favorable environmental conditions, Nevada quickly became the only possible location for the permanent repository.²⁷ On December 17, 1987, Congress amended the NWA and designated Yucca Mountain as the sole location for a repository site.²⁸

Congress decided on Yucca Mountain, not just as a result of political pressure, but also because of the lack of human population, dry climate, and low precipitation rates.²⁹ These considerations are crucial for the sustainability of a permanent repository, because water is the primary mechanism by which radioactive particles may be transported from the repository.³⁰ Geologic disposal involves the placement of carefully packaged radioactive waste in tunnels underneath the Earth's surface, with several layers of protection to ensuring the particles do not escape.³¹ Naturally-occurring, thick, unsaturated rock and man-made barriers work to prevent the SNF from moving inside the repository.³²

Despite the positive aspects, many problems exist with the selection of Yucca Mountain as a permanent repository: the area is prone to earthquakes; there is evidence of recent volcanic activity; and the repository is located thousands of miles from most of the accumulating

25. See 42 U.S.C. §§ 10132(b)-(c); See also Melzer, *supra* note 15, at 851.

26. U.S. DEP'T OF ENERGY, DOE/S-0048, *Recommendation by the Secretary of Energy of Candidate Sites for the First Radioactive-Waste Repository* at 1, 9 (1986).

27. *If Not Yucca Mountain, then what? An Alternative Plan for Managing Highly Radioactive Waste in the United States*, INST. FOR ENERGY AND ENVTL. RESEARCH, <https://perma.cc/5E35-2KB8> (last visited Sept. 7, 2018).

28. 42 U.S.C. § 10172(a); Debra J. Carfora, *Building a Sustainable Energy Future: Offering a solution to the Nuclear Waste Disposal Problem Through Reprocessing and the Rebirth of Yucca Mountain*, 8 TEX. J. OIL GAS & ENERGY L. 143, 155 (2012).

29. Annemarie Wall, *Going Nowhere in the Nuke of Time: Breach of the Yucca Contract, Nuclear Waste Policy Act Fallout and Shelter in Private Interim Storage*, 12 ALB. L. ENVTL. OUTLOOK J. 138, 162 (2007); Alejandro Gomez, *Issues Surrounding Proposal for Nuclear Waste Repository at Yucca Mountain*, INDIANA UNIV. EARTH & ATMOSPHERIC SCIENCES, <https://perma.cc/QVH9-NMAG> (last visited Oct. 12, 2017).

30. *Id.*

31. Wall, *supra* note 29, at 163.

32. *Id.*

waste.³³ The volatile nature of Yucca Mountain could potentially result in the radioactive waste escaping from the permanent repository. Additionally, the large distance of the reactor sites from Yucca Mountain creates the additional problem of transferring the waste such great distances through multiple jurisdictions. The DOE will likely implement a combination of rail, road, and barge, using vast, sealed containers³⁴ to transport the nuclear waste to the permanent repository.³⁵ The current rule regarding SNF only allows shipment along specified routes with NRC approval and notification to state officials through which the shipments travel.³⁶ Before allowing the selection of Yucca Mountain, the DOE should address these issues.

To this day, the 1987 NWA amendments prohibit the DOE from constructing any consolidated interim storage facility for commercial nuclear waste until a license has been granted for the permanent geologic repository.³⁷ In 1987, Congress believed that these restrictions blocked the potential undermining of the development of a geologic repository.³⁸ By not allowing consolidated interim storage until the granting of the license for a permanent repository, proponents of the bill hoped to prevent its detractors from thwarting the creation. If consolidated interim storage facilities could not be created without the license, Congress believed political pressure would force an agreement regarding the location for a permanent repository. Thirty years' hindsight has proven otherwise, as a license for a permanent repository still does not exist.

The NWA required the DOE to enter into contracts for the disposal of radioactive waste and to begin accepting fuel at Yucca Mountain by January 31, 1998.³⁹ These contracts formed the basis of the Nuclear Waste Fund (NWF) and contained fee provisions that would go toward the

33. See Marta Adams, *Yucca Mountain—Nevada's Perspective*, 46 IDAHO L. REV. 423, 425-426 (2010).

34. "Containers must be able to withstand a sequence of crashes, fire and submersion in water without breaking open. The approved containers are massive, weighing between 25 tons and 40 tons for truck shipments and between 75 tons and 125 tons for rail shipments. Multiple layers of steel and other materials confine the radioactivity. Typically, for every ton of fuel, there are more than three tons of protective shielding." *Transportation of Used Nuclear Fuel*, NUCLEAR ENERGY INST., <https://perma.cc/DC6Q-33QH> (last visited Jan. 21, 2018).

35. *Id.*

36. *Id.*

37. 42 U.S.C. § 10165(b), 10168(d)(1).

38. Stewart & Stewart, *supra* note 13, at 67.

39. 42 U.S.C. § 10222(c).

creation of the proposed permanent repository.⁴⁰ The acceptance date depended upon the Environmental Protection Agency's (EPA), NRC's, and President's timely completion of preliminary duties, including the creation of regulations with which the DOE must thereafter be in compliance.⁴¹ Specifically, the EPA had to promulgate rules protecting the environment from the release of radioactive materials in repositories.⁴² The NRC had to create rules regarding the training of nuclear power plant operators.⁴³ The President had to consider Yucca Mountain as a qualified repository and make a recommendation to Congress.⁴⁴ Congress believed the 1998 date allowed the completion of all of the assigned duties.

Two years before the 1998 deadline, the DOE attempted to default on the contract.⁴⁵ The fee-paying parties of the nuclear waste fund quickly petitioned for review.⁴⁶ Although courts tend to provide agencies much deference, the U.S. Court of Appeals for the D.C. Circuit confirmed the DOE's unconditional obligation to dispose of the waste beginning January 31, 1998.⁴⁷ When the deadline passed, the fee-paying parties sued the agency. Courts have consistently ruled in favor of the fee-paying generators.⁴⁸

Because the DOE failed to establish a geologic repository, the D.C. Circuit ordered the DOE to submit a proposal to Congress, changing the fee to zero, which effectively stopped the DOE from collecting any money

40. These fees were initially set at 1 mill (0.1 cents) per kilowatt-hour of nuclear electricity produced. *Report to the Secretary of Energy, BLUE RIBBON COMM'N ON AM.'S NUCLEAR FUTURE*, 9, 70 (2012); *See* 42 U.S.C. § 10222(a)(1) (2000).

41. 42 U.S.C. § 10141(a). 42 U.S.C. § 10266. 42 U.S.C. § 10134(a)(1), (2).

42. 42 U.S.C. § 10141(a).

43. 42 U.S.C. § 10266.

44. 42 U.S.C. § 10134(a)(1), (2).

45. *Department of Energy Final Interpretation of Nuclear Waste Acceptance Issues*, 60 FED. REG. 21793, 21794 (May 3, 1995).

46. *See Indiana Mich. Power Co. v. Dep't of Energy & United States*, 88 F.3d 1272, 1277 (D.C. Cir. 1996).

47. The formulation of procedures should basically be left within the discretion of the agencies to which Congress has confided the responsibility for substantive judgments. *See Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 523-525 (1978); *See Indiana Mich. Power Co.* 88 F.3d at 1277.

48. *E.g.*, *Sacramento Mun. Util. Dist. v. United States*, 65 Fed. Cl. 180, 181 (Fed. Cl. 2005); *Wis. Elec. Power Co. v. United States*, No. 00-697 (Fed. Cl. 2004); *Tenn. Valley Auth. V. United States*, 60 Fed Cl. 665 (Fed. Cl. 2004); *Southern Nuclear Operating Co. v. United States*, No. 98-614 (Fed. Cl. 2004); *Fla. Power & Light Co. v. United States*, No. 98-486 (Fed. Cl. 2002); *Commonwealth Edison Co. v. United States*, No. 98-484 (Fed. Cl. 2001).

for the NWF.⁴⁹ Upon termination of the fee, the NWF valued at over \$36 billion.⁵⁰ The DOE cannot use private interim storage to meet its obligation to take title to the waste without a licensed permanent repository.⁵¹ In order to remedy the DOE's breach of contract and allow the use of private interim storage, Congress must amend the NWPAct to specifically allow the use of private interim storage despite the lack of a licensed permanent repository.

C. Presidential Authority

The DOE formally presented a license application for Yucca Mountain to the NRC in 2008, citing the massive amount of money, research, and time spent securing Yucca Mountain as a repository site.⁵² The DOE concluded that Yucca Mountain could safely act as the nation's permanent repository after spending fourteen billion dollars for design, engineering, and testing activities of Yucca Mountain.⁵³ The NRC conducted a two-prong review of the application by assessing the technical merits of the repository design, deciding whether to issue a construction authorization for the repository, and adjudicating hearings by the NRC's Construction Authorization Board to consider technical and legal challenges to the application.⁵⁴

49. Nat'l Ass'n of Regulatory Util. Comm'rs v. U.S. Dept. of Energy, 736 F.3d 517, 521 (D.C. Cir. 2013); Richard B. Stewart & Jane B. Stewart, *Solving the Spent Nuclear Fuel Impasse*, 21 N.Y.U. ENVTL. L.J. 1, 4 (2014).

50. See DEP'T OF ENERGY, OFFICE OF INSPECTOR GENERAL, *The Department of Energy's Nuclear Waste Fund Fiscal Year 2013 Financial Statements* (Dec. 2013).

51. Wall, *supra* note 29, at 144.

52. "After careful evaluation, I am convinced that the product of over 20 years, millions of hours, and four billion dollars of research provides a sound scientific basis for concluding that the site can perform safely . . . and that it is indeed scientifically and technically suitable for development as a repository," *Recommendation by the Secretary of Energy Regarding the Suitability of the Yucca Mountain Site for a Repository under the Nuclear Waste Policy Act of 1982*, U.S. DEP'T OF ENERGY at 45 (2002). See generally U.S. NUCLEAR REG. COMM'N, YUCCA MOUNTAIN REPOSITORY LICENSE APPLICATION (LA) FOR CONSTRUCTION AUTHORIZATION (June 3, 2008).

53. *Nuclear Waste Management: Key Attributes, Challenges, and Costs for the Yucca Mountain Repository and Two Potential Alternatives*, U.S. GOV. ACCOUNTABILITY OFFICE, <https://perma.cc/C6FU-KYHH> (last visited Jan. 18, 2018).

54. *Yucca Mountain*, ENERGY AND COMMERCE, <https://perma.cc/T5GH-LWBZ> (last visited Jan. 16, 2018).

A year later, on March 5, 2009, the Secretary of Energy under newly-elected President Obama, Steven Chu, confirmed in a committee hearing that Yucca Mountain was no longer a candidate for a nuclear repository site. The Obama Administration had taken an anti-Yucca stance.⁵⁵ The DOE submitted a motion to withdraw the licensing of Yucca Mountain to the NRC's Construction Authorization Board; however, the DOE did not concede that Yucca was defective or unsafe.⁵⁶ The DOE's motion stated that it "reaffirm[ed] its obligation to take possession and dispose of the nation's spent nuclear fuel and high-level nuclear waste, but the Secretary of Energy has decided that . . . Yucca Mountain is not a workable option."⁵⁷ The motion to withdraw failed on procedural grounds.⁵⁸ The NRC Construction Authorization Board stated that the NWPA mandated a resolution on the merits by the NRC, a process the Secretary of Energy could not override this process.⁵⁹

On January 11, 2013, the DOE announced a proposed plan to have a pilot facility for the interim storage of used fuel from shutdown reactor sites operational by 2021, a larger interim storage facility completed by 2025, and a final geologic repository by 2048.⁶⁰ The DOE published this report in response to the recommendations from President Obama's Blue Ribbon Commission (BRC).⁶¹ The BRC discussed consent-based facilities including system design and funding.⁶²

55. *Full Committee Hearing: To Receive Testimony Regarding Draft Legislative Proposals on Energy Research and Development (SH-216) Before the S. Comm. on Energy and Natural Resources*, 111th Cong. (2009)(statement of Steven Chu, Secretary of Energy) (indicating the DOE's disapproval of Yucca Mountain through discourse with Senator McCain), U.S. SENATE COMMITTEE ON ENERGY AND NATURAL RESOURCES (2009), <https://perma.cc/U6C2-B9BU>.

56. See U.S. Department of Energy's Motion to Withdraw, *In re* U.S. Dep't of Energy (High-Level Waste Repository), ASLBP No. 09-892-HLW-CAB04 (U.S. Nuclear Regulatory Comm'n Mar. 3, 2000). (No. 63-001).

57. See U.S. Department of Energy's Motion to Withdraw, *In re* U.S. Dep't of Energy (High-Level Waste Repository), ASLBP No. 09-892-HLW-CAB04 (U.S. Nuclear Regulatory Comm'n Mar. 3, 2000). (No. 63-001) at 1.

58. *Id.*

59. See *In re* U.S. Dep't of Energy, 71 N.R.C. 609, 629 (2010) ("We Conclude that . . . DOE lacks authority to seek to withdraw the Application."); *Yucca Mountain*, ENERGY AND COMMERCE, <https://perma.cc/B4RB-GJVE>, (last visited Jan. 16, 2018).

60. Steven Chu, *Strategy for the Management & Disposal of Used Nuclear Fuel & High-level Radioactive Waste*, U.S. DEP'T OF ENERGY (2013) at 1, <https://perma.cc/S3Y9-7VND>.

61. *Id.* at 5.

62. *Id.* at 4.

After the election of President Donald Trump, the DOE returned to Yucca Mountain as an option for a permanent repository location. President Trump's 2018 budget proposal calls for \$120 million to restart licensing procedures for the Yucca Mountain nuclear waste repository.⁶³ Although the DOE shares power regarding the administration of the NWPA, the NRC independently holds the sole authority to determine whether the executive branch can terminate or continue the Yucca Mountain process.⁶⁴

III. MOVING FORWARD WITH NUCLEAR WASTE IN 2018: SAVING AMERICA FROM NUCLEAR DESTRUCTION

While the selection of a permanent repository remains uncertain, the federal government can no longer wait before accepting the nuclear waste sitting at locations all over the country. Congress should amend the NWPA to allow the use of consolidated interim facilities to store the nuclear waste until the government reaches a decision regarding a permanent repository. Private companies have petitioned for licensing of nuclear waste facilities, and the government should allow their creation.

A. Consolidated Interim Facilities

Since the government cannot reach a consensus about Yucca Mountain as a permanent repository, the United States should establish interim facilities to assume control of the nuclear waste. The United States' inability to arrive at a unified solution to the nation's nuclear waste crisis has resulted in a stockpile of nuclear waste remaining on-site at nuclear plants.⁶⁵ Leaving the nuclear waste on-site raises safety concerns and hinders the locations' ability to be used for other purposes in the future.⁶⁶ Additionally, critics are concerned that the highly radioactive

63. Ben Wolfgang, *Trump's Former Las Vegas Cohorts Gird Battle to Stop his Yucca Mountain Nuclear Waste Plan*, THE WASHINGTON TIMES, (Aug. 6, 2017), <https://perma.cc/ZH48-VNR3> (last visited Jan. 21, 2018).

64. See *In re Aiken County*, 645 F. 3d 428, 439 (Kavanaugh, J., concurring) ("[Yucca is a mess because the executive agency (The Department of Energy) and the independent agency (the Nuclear Regulatory Commission have overlapping statutory responsibilities). See also Wolfgang at 443 ("[The President] is powerless to direct or supervise the Nuclear Regulatory Commission. . . .").

65. Christopher Keegan, *What's worse, Nuclear Waste or the United States' Failed Policy for its Disposal*, 49 U. RICH. L. REV. 1265, 1266 (2014).

66. *Report to the Secretary of Energy*, BLUE RIBBON COMM'N ON AM.'S NUCLEAR FUTURE, 9, 35 (2012) (explaining that nuclear waste left on-site at

nuclear waste could be susceptible to terrorism and natural disasters.⁶⁷ The federal government has failed to provide the nuclear power plants around the country with a permanent repository to consolidate and control the mounting nuclear waste.

The federal government has consistently stated that storing nuclear waste on-site at the commercial nuclear plants is not dangerous.⁶⁸ Former DOE Secretary Chu believed that dry cask storage⁶⁹ at reactor sites could hold the spent nuclear waste while alternatives to Yucca were explored.⁷⁰ Despite the government's confidence about the safety of the nuclear waste remaining at the plant, the 2011 Fukushima incident demonstrates that dangerous incidents can occur. On March 11, 2011, a major earthquake caused a 15-metre tsunami to disable the power supply of three Fukushima Daiichi reactors, causing a nuclear crisis.⁷¹ By losing power supply, the nuclear reactors melted resulting in high radioactive release.⁷² By moving the nuclear waste to consolidated interim storage facilities, additional disasters could be avoided.

In some instances of on-site storage, decommissioning of nuclear reactors has occurred.⁷³ The licensees that own the reactors have removed

shutdown power plants prevents the land from other economically beneficial uses).

67. Stewart & Stewart, *supra* note 49, at 4.

68. *Id.* at 10-11.

69. "Dry cask storage allows spent fuel that has already been cooled in the spent fuel pool for at least one year to be surrounded by inert gas inside a container called a cask. The casks are typically steel cylinders that are either welded or bolted closed. The steel cylinder provides a leak-tight confinement of the spent fuel. Each cylinder is surrounded by additional steel, concrete, or other material to provide radiation shielding to workers and members of the public. Some of the cask designs can be used for both storage and transportation." *Dry Cask Storage*, U.S. NUCLEAR REG. COMM'N (Sept. 27, 2018), <https://perma.cc/GD85-5MB7> (last visited Nov. 12, 2017).

70. Peter Behr, *The Administration Puts Its Own Stamp on a Possible Nuclear Revival*, N.Y. TIMES (Feb. 2, 2010), <https://perma.cc/D2GZ-E36M> (last visited Jan. 21, 2018). See also, Stewart & Stewart, *supra* note 49, at 10.

71. "There have been no deaths of cases of radiation sickness from the nuclear accident, but over 100,000 people were evacuated from their homes to ensure this." *Fukushima Accident*, WORLD NUCLEAR ASS'N, <https://perma.cc/Z2ZH-G7MA> (updated June 2018).

72. *Id.*

73. Decommissioning "involves safely removing a facility or site from service and reducing residual radioactivity to a level that permits the license to be terminated, with the property released either for unrestricted use or under specified restricted conditions." *Sites Undergoing Decommissioning (by Location*

the facility from service by reducing the residual radioactivity of the site to a level that permits the license to be terminated.⁷⁴ This means that the plants are simply used to store SNF.⁷⁵ Because the sites are no longer generating any revenue from electricity production, the sites have the heavy burden of paying the maintenance and security costs that come with maintaining stored nuclear waste.⁷⁶ By implementing interim facilities, the decommissioned facilities would have a place to move their spent fuel, allowing the site to be used for other purposes. Due to the federal government being in breach of contract since 1998 for failure to take title to the nuclear waste overflowing around the Nation, establishing interim facilities would allow the government to begin meeting its obligation without having to wait for the construction of a permanent repository.⁷⁷

Critics of the consolidated interim storage facilities contend there will be too much political opposition from local communities wherever the federal government decides to create the facilities.⁷⁸ Additionally, the nuclear waste would have to be transported twice; first to the interim storage facility, and finally to the permanent repository.⁷⁹ The United States Government Accountability Office estimated that an interim storage facility would take nineteen years to create and cost \$23 billion to \$81 billion.⁸⁰

The timeline to create an interim facility should jolt the United States into immediate action. A typical nuclear plant generates 20 metric tons of spent nuclear fuel per year. In total, the United States generates about 2,000 to 2,300 metric tons of spent fuel per year.⁸¹ If the federal government waits for the permanent repository—Yucca Mountain or elsewhere—to be finished, the United States might already be inundated by nuclear waste.

or Name), U.S. NUCLEAR REG. COMM'N, <https://perma.cc/DQF5-F5TR> (last visited Nov. 12, 2017).

74. Joseph D. McManus, *Lights Out: Decommissioning the American Nuclear Plant*, 36 J. NAT'L ASS'N ADMIN. L. JUDICIARY 518, 519 (2016).

75. *Id.* at 540.

76. *Id.* at 544.

77. Stewart & Stewart, *supra* note 49, at 4.

78. Funk and Sovacool, *supra* note 6, at 138.

79. *Id.*

80. *Nuclear Waste: Disposal Challenges and Lessons Learned from Yucca Mountain*, U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-11-731T, 12 (2011).

81. *On-Site Storage of Nuclear Waste: Used Nuclear Fuel and High-Level Radioactive Waste*, NUCLEAR ENERGY INST., <https://perma.cc/Y3XE-B8LH> (last visited Jan. 18, 2018).

In order to implement a plan for nuclear waste at an interim location, Congress must amend the NWPAs to allow the implementation of an interim storage plan.⁸² As amended in 1987, the NWPAs prohibit the construction of an interim storage facility until a geologic repository is licensed.⁸³ Yucca Mountain is presently the only site that can be considered for a geologic repository due to the wording of the NWPAs 1987 amendment.⁸⁴ Thus, Congress must amend or repeal the NWPAs to allow the implementation of an interim storage plan.

B. Salvation on the Horizon: Yucca Mountain 2017 Compromise Bill

On June 28, 2017, the House Energy and Commerce Committee advanced the Yucca Mountain compromise bill that aimed to break the partisan stalemate over nuclear waste. The bill proposed to restart the Energy Department and Nuclear Regulatory Commission's efforts to license Nevada's Yucca Mountain as a permanent repository for nuclear waste currently stored at United States power plants. The Energy and Commerce Committee approved it 49-4.⁸⁵ Although many independent scientists have found Yucca Mountain to be an unsafe location for a permanent repository, the Trump Administration chose to move forward with the project.⁸⁶ While still focusing on Yucca Mountain, the bill amends the NWPAs to allow interim storage facilities, a necessity to ameliorate the nuclear waste crisis.⁸⁷

The permanent repository at Yucca Mountain would expand the amount of waste that could be stored in the facility from 70,000 to 110,000 metrics tons.⁸⁸ The bill would also authorize temporary storage of nuclear waste at other sites, which attracted support from districts that are home to decommissioned nuclear power plants that continue to store radioactive

82. Keegan, *supra* note 65, at 1283.

83. *Id.* at 1284.

84. Nuclear Waste Policy Amendments Act of 1987, Pub. L. No. 100-203, Sec. 5011 § 5011 §160, 101 STAT. 227, 228 (codified as amended at 42 U.S.C. 10168 (2012)).

85. Dillon, *supra* note 1.

86. Sarah Zhang, *The White House Revives a Controversial Plan for Nuclear Waste: Yucca Mountain is back, and the Nevadans are not happy*, THE ATLANTIC (Mar. 21, 2017), <https://perma.cc/5NAK-9ND4>.

87. Ozone Standards Implementation Act of 2017, H.R. 806, 115 Cong. (2017-2018); Brownfields Enhancement, Economic Redevelopment, and Reauthorization Act of 2017, H.R. 3017, 115 Cong. (2017-2018); Nuclear Waste Policy Amendments Act of 2017, H.R. 3053, 115 Cong. (2017-2018), <https://perma.cc/AY2D-FMTR>.

88. Dillon, *supra* note 1.

waste. Temporary storage offers a quicker, cheaper interim solution while Yucca undergoes years of review.⁸⁹ The non-federal storage facilities created must hold the NRC license, and the project must have state and local support prior to entering a contract.⁹⁰

The compromise would enable the Energy Department to move forward with a pilot temporary storage facility—authorizing \$150 million for the process—and store waste at that location or one owned by a private company so long as the Yucca Mountain licensing process continues.⁹¹ The compromise does not tie the interim storage effort to a final approval for Yucca, as the original draft did.⁹² Connecting the two projects meant that interim storage facilities could not be created unless the creation of Yucca Mountain had commenced.⁹³ The compromise bill would sever the link, placing the two on parallel, but not interdependent, tracks.⁹⁴ Representative Scott Peters emphasized that “by continuing this linkage we are creating additional uncertainty that may undermine or dissuade a potential private entity from pursuing interim as a business model.”⁹⁵ As such, the amendment to strike the linkage between Yucca and a consolidated interim solution is called the Peters Amendment.

Yucca Mountain also presents a huge problem regarding Nevada’s water rights. The federal government attempted to take Nevada’s water for Yucca Mountain. In July 1997, the DOE filed five applications with the office of the Nevada State Engineer “under provisions of state water law to permanently appropriate 430 acre-feet of groundwater in anticipation of a congressional decision authorizing” the DOE to seek NRC approval to construct and operate a “proposed high-level nuclear waste repository in Yucca Mountain.”⁹⁶ As a general rule, state law governs the use of water within a state.⁹⁷ The building of the permanent repository would require

89. *Id.*

90. Ozone Standards Implementation Act of 2017, H.R. 806, 115 Cong. (2017-2018); Brownfields Enhancement, Economic Redevelopment, and Reauthorization Act of 2017, H.R. 3017, 115 Cong. (2017-2018); Nuclear Waste Policy Amendments Act of 2017, H.R. 3053, 115 Cong. (2017-2018), <https://perma.cc/KS8X-6MAY>.

91. Dillon, *supra* note 1.

92. *Id.*

93. *Id.*

94. Ozone Standards Implementation Act of 2017, H.R. 806, 115 Cong. (2017-2018); Brownfields Enhancement, Economic Redevelopment, and Reauthorization Act of 2017, H.R. 3017, 115 Cong. (2017-2018); Nuclear Waste Policy Amendments Act of 2017, H.R. 3053, 115 Cong. (2017-2018), <https://perma.cc/KS8X-6MAY>.

95. *Id.*

96. See Marta Adams, *Yucca Mountain—Nevada’s Perspective*, 46 IDAHO L. REV. 423, 440 (2010).

97. *Id.*

the use of substantial amount of water, which Nevada deemed detrimental to public interest violating state water law. This compromise bill protects Nevada's sovereignty by removing a provision that would have stripped Nevada of its water and air permitting authority for the site.⁹⁸

The proposed bill is not without its critics. Robert J. Halstead, Executive Director of the governor's agency for nuclear projects, said the bill is still "Screw Nevada 2."⁹⁹ Opponents of the bill believe it will turn Nevada into America's site for nuclear waste despite the new incentives proposed by the 2017 bill. Many supporters of the new bill believe it reads better for Nevada, but these supporters of the bill established provisions that prohibit nuclear waste storage in their own districts.¹⁰⁰ States in the Great Lakes area approve of the bill but do not think the repository would be safe in their own states. This hypocrisy illustrates that states should have a voice when it comes to choosing a permanent repository that could affect its people for years to come.

1. Allowing the States to have a Say: The Introduction of the Consent-Based Approach

Consent-based facilities¹⁰¹ encourage communication and agreement by all affected units of government that are willing to accept a facility in their jurisdiction, including: the host state or tribe; regional and local authorities; and the host community.¹⁰² The BRC emphasized that the

98. Dillon, *supra* note 1.

99. Yvonne Gonzales, *House Panel Oks Nuclear Waste Storage Bill Tied to Yucca Mountain*, LAS VEGAS SUN (June 28, 2017), <https://perma.cc/7TKB-7YFJ> (last visited Jan. 21, 2018).

100. *Id.*

101. In its 2013 management strategy, DOE interpreted what consent-based facilities means:

In practical terms, this means encouraging communities to volunteer to be considered to host a nuclear waste management facility while also allowing for the waste management organization to approach communities it believes can meet the siting requirements. Under such an arrangement, communities could volunteer to provide a consolidated interim storage facility and/or a repository in expectation of the economic activity that would result from the siting, construction, and operation of such a facility in their communities.

Moving Forward with Consent-Based Siting for Nuclear Waste Facilities: Recommendations of the BPC Nuclear Waste Council, BIPARTISAN POLICY CENTER, <https://perma.cc/C4AJ-Z5A4> (last visited Jan. 18, 2018).

102. *America's Nuclear Solution*, BLUE RIBBON COMM'N ON AM.'S NUCLEAR FUTURE (2017), <https://perma.cc/LAD3-2ENF> (last visited Jan. 18, 2018).

process of finding locations for nuclear waste will only work if transparency, flexibility, patience, and a heavy emphasis on cooperation exists between all parties involved.¹⁰³

In January 2016, the DOE launched its Consent-Based Siting Initiative.¹⁰⁴ In order to find a content-based facility, the initiative consists of three phases: (1) an initial public engagement effort designed to solicit participant input on how to structure the consent-based process; (2) an effort to design a siting process based on input gathered during the first phase; and (3) further work with communities that might be interested in hosting a nuclear waste management facility.¹⁰⁵ To further support the idea of consent-based facilities, United States Senator Catherine Mastro noted that local consent should be required for any nuclear repository or storage facility. Senator Mastro stated, “It is unjust and unfair to force Nevadans to live next to a nuclear waste dump that could harm both their health and livelihood.”¹⁰⁶ In order to encourage states to consent to a permanent repository, the federal government must offer incentives.

2. Incentivizing the States to save America from Nuclear Destruction

Critics of the compromise bill have advocated for a local consent-based approach to finding a storage facility.¹⁰⁷ Yucca Mountain receives backlash as a geologic repository because the project is driven by state politicians rather than the actual people that will be affected by the selection of the location. The Blue Ribbon Commission and the DOE under President Obama both supported a consent-based approach for determining locations.¹⁰⁸

The compromise bill contains infrastructure-related incentives meant to entice Nevada and ease its opposition to the repository. Heavy opposition by Nevada led the Obama administration to abandon the

103. *Id.*

104. As of 2016, the DOE held public meetings on consent-based siting in Chicago, Illinois; Atlanta, Georgia; Sacramento, California; Denver, Colorado; Boston, Massachusetts; Tempe, Arizona; Boise, Idaho; and Minneapolis, Minnesota. *Moving Forward with Consent-Based Siting for Nuclear Waste Facilities: Recommendations of the BPC Nuclear Waste Council*, BIPARTISAN POLICY CENTER, <https://perma.cc/SMR7-XHSG> (last visited Jan. 18, 2018).

105. *Id.*

106. Gonzales, *supra* note 99.

107. Dillon, *supra* note 1.

108. *Report to the Secretary of Energy*, BLUE RIBBON COMM’N ON AM.’S NUCLEAR FUTURE 9, 1-2 (2012).

approval process in the first place.¹⁰⁹ While there are few specifics on these incentives, Congress has discussed the possibility that new infrastructure, schools, water rights, and financial incentives could potentially change Nevada's perspective regarding Yucca as the nation's permanent repository.¹¹⁰ The federal government should also provide economic incentives to States that are willing to house consolidated interim storage facilities or geologic repositories.¹¹¹ These incentives could include federal tax breaks, infrastructure, schools, or funding for communities willing to house nuclear waste in an interim facility. Interim storage facilities are on the verge of becoming a reality, with firms seeking licenses from the NRC.

a. Texas Firm Applies for Nuclear Waste License

Private companies are currently seeking a license to operate an interim facility. A Texas company, Waste Control Specialists, LLC, has submitted an application to the NRC to construct and operate a large interim storage facility for commercial nuclear waste with the caveat that the DOE assume liability for the waste.¹¹² A \$5.2 billion facility in Andrews County, Texas capable of storing 40,000 metric tons of used nuclear waste petitioned the NRC for licensing.¹¹³ In order for the DOE to assume liability for the waste, Congress would need to amend the NWPA as discussed above.¹¹⁴ Waste Control Specialists, LLC, a treatment, storage, and disposal company dealing in radioactive and hazardous wastes, says the facility will implement dry cask storage¹¹⁵ identical to those used at nuclear plants but on a larger scale.¹¹⁶ The company will prioritize the waste from seven decommissioned nuclear plants across the United States.¹¹⁷

Part 72 of Title 10 of the Code of Federal Regulations gives NRC the authority to license and regulate spent fuel storage facilities.¹¹⁸ To approve this project, the NRC will conduct two parallel reviews: one for safety and

109. Dillon, *supra* note 1.

110. Timothy Cama, *Yucca project could bring economic incentives to Nevada*, THE HILL (May 11, 2015), <https://perma.cc/83LL-WQU4> (last visited Jan. 21, 2018).

111. Keegan, *supra* note 65, at 1284.

112. Bloom, *supra* note 11.

113. *Id.*

114. *Id.*

115. U.S. NUCLEAR REG. COMM'N, *supra* note 69.

116. Bloom, *supra* note 11.

117. *Id.*

118. 10 CFR Part 72; Bloom, *supra* note 11.

one for potential environmental impacts.¹¹⁹ Opposition to the Texas site is mounting. Antinuclear groups, Beyond Nuclear and Nuclear Information and Resource Service, and environmental group, Sustainable Energy and Economic Development (SEED) Coalition, asked the NRC to terminate review of the license application.¹²⁰ The groups worry that the interim storage facility may become the de facto permanent home for the highly toxic waste.¹²¹ While these groups have a legitimate concern, the need to handle the United States nuclear waste crisis outweighs this potential problem.

Waste Control Specialists, LLC is not the only private company seeking a license to open an interim storage facility. Holtec International¹²² proposed a consolidated interim storage facility in southeast New Mexico.¹²³ Holtec submitted its license application to the NRC on March 31, 2017, with plans to use Hi-STORM UMAX¹²⁴ technology to hold 10,000 canisters of used nuclear fuel in a 288-acre underground facility until a permanent repository becomes available.¹²⁵ Congress must amend the NWA before the NRC can grant a license to either of these facilities.

IV. HOLDING BLAME IN THE EVENT OF NUCLEAR DESTRUCTION: LIABILITY OF INTERIM STORAGE FACILITIES

If Congress amends the NWA to allow interim storage of nuclear waste, the problem of liability for the nuclear waste must be addressed. In

119. *Id.*

120. Sonal Patel, *DOE Seeks More Information on Private Interim Nuclear Waste Storage Facilities*, POWER MAG (Oct. 31, 2016), <https://perma.cc/BT6Z-N4PY> (last visited Jan. 21, 2018).

121. *Id.*

122. “Holtec International is a diversified energy technology company with its headquarters located in Jupiter on Florida’s ‘Treasure Coast.’ The company is widely recognized as the foremost technology innovator in the field of carbon-free power generation, specifically commercial nuclear and solar energy.” <https://perma.cc/K84L-KGMG>.

123. Patel, *supra* note 120.

124. “The HI-STORE CIS storage facility, consisting of HI-STORM UMAX vertical ventilated system, is engineered to be immune to extreme environmental phenomena such as hurricanes, floods, tornados, and earthquakes. HI-STORE CIS is designed to withstand a crashing aircraft or an (improbable) on-site fire without any radiological consequences.” *HI-STORE CISF: Holtec’s Proposed Consolidated Interim Storage Facility in Southeastern New Mexico*, HOLTEC INT’L (2018), <https://perma.cc/D6YR-RX9E>.

125. *Holtec Submits New Mexico Interim Storage License Application*, NUCLEAR ENERGY INST., <https://perma.cc/RT5V-RHTE> (last visited Oct. 15, 2017).

addition to the proposed permanent repository, the 1987 NWA amendments originally sought to provide a solution to the nuclear waste problem with the creation of a Monitored Retrievable Storage facility (MRS).¹²⁶ The MRS would temporarily hold the nuclear waste while the permanent repository remained under construction.¹²⁷ Although the MRS creation failed, the 1987 NWA amendments provided direction for a MRS facility that can be used for comparison for interim storage facilities.¹²⁸ Under the original NWA scheme, the DOE had the duty to construct and operate the MRS facility.¹²⁹ The Secretary of Energy had to select a site and submit a license application to the NRC for the construction of the MRS facility.¹³⁰

The statutes from the 1987 NWA amendments governing the MRS are subject to many of the provisions set out in the statutes that govern the development of the permanent repository. The NWA amendments specify that the Secretary of Energy will assist states in resolving liability concerns arising from nuclear accidents.¹³¹ The NWA provided that the Price Anderson Act would cover any liability arising from an incident at a government MRS facility.¹³² Section 2210(d)(1)(B)(ii) states that any “[p]ublic liability arising out of nuclear waste activities . . . shall be compensated from the Nuclear Waste Fund”¹³³ The Price Anderson Amendments Act of 1988 stated its intention that Price Anderson protection would apply to an MRS facility.¹³⁴

The Price Anderson Act does not explicitly state that it will cover the liability of private facilities, but an examination of the relevant laws and regulations indicates that Price Anderson will cover these facilities. Originally, the government required nuclear reactor sites to have insurance in the event of a disaster under the Price Anderson Act. Today, any private

126. See Nuclear Waste Policy Amendments Act of 1987, 42 U.S.C. §§ 10162-10169 (1994).

127. *Id.*

128. *Id.*

129. *Id.*

130. *Id.*

131. See Price-Anderson Act of 1957, 42 U.S.C. § 10161(h) (1994). (“Any facility authorized pursuant to this section shall be subject to the provisions of sections 10135, 1013(b), 10136(d), 10137, and 10138 of this title.”).

132. See Price-Anderson Act of 1957, 42 U.S.C. § 2210(d) (1994).

133. John Gross, *Nuclear Native America: Nuclear Waste and Liability on the Skull Valley Goshute Reservation*, 7 B.U. J. SCI. & TECH. L. 140 (2001).

134. See S. Rep. No. 100-218, at 10 (1988), as reprinted in 1988 U.S.C.C.A.N. 1476, 1485 (“[T]he bill clarifies that DOE’s authority to indemnify its contractors extends to those contractual activities involving the storage, transportation, and disposal of spent nuclear fuel, high-level radioactive waste, and transuranic waste.”).

entity planning to construct and operate an independent spent fuel storage facility must first obtain a license from the NRC.¹³⁵ Under Price Anderson, the NRC may require licensees to maintain financial protection, likely in the form of private insurance.¹³⁶ Section 2210(b) of 42 U.S.C. allows the NRC to adjust the amount of required insurance for licensees whose nuclear activities are not for the purpose of generating power.¹³⁷ Thus, the NRC can regulate how much insurance a private interim facility would be required to have.

On the other hand, the Price Anderson Act, read literally, indicates that private interim facilities may not be indemnified. Section 2014(q) of the Act defines “nuclear incidents” as “any occurrence . . . causing sickness, disease or death, or loss of or damage to property, or loss of use of property arising out of or from radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material.”¹³⁸ SNF may not be classified as “source, special nuclear or by-product material.”¹³⁹ Any potential accident that may occur from spent nuclear fuel might not be protected under Price Anderson. However, the NRC should consider spent nuclear fuel as a “source material” for all intended purposes to keep in accordance with the spirit of the definition.¹⁴⁰

The Price Anderson Act should work to indemnify the private interim facilities. Since these private facilities would operate to allow the federal government to end its breach of contracts with the reactor sites who paid into the Nuclear Waste Fund, it logically follows that the federal government would assist these facilities with liability protection by applying the Price Anderson Act.

V. A SAVIOR FROM NUCLEAR DESTRUCTION: THE POSSIBILITY OF FUEL REPROCESSING

Alternatively, or possibly in addition to the creation of private interim facilities, one potential avenue to take regarding SNF is reprocessing. Reprocessing is the treatment of SNF to allow it to be used again in the

135. See generally 10 C.F.R. pt. 72 (2000).

136. See 42 U.S.C. § 2210(c).

137. See § 2210(b)(1)(B)-(C). See also Gross, *supra* note 133, at 154; Price-Anderson Act of 1957, 42 U.S.C. § 2210(d) (1994).

138. 42 U.S.C. § 2014(q).

139. 42 U.S.C. § 2014(q).

140. 42 U.S.C. § 2014(z) (Defining “source material” as “uranium, thorium, or any other material which is determined by the Commission...to be source material...”).

nuclear process.¹⁴¹ France engages in fuel reprocessing “at a time when U.S. nuclear policy . . . has been locked in a state of perpetual indecision.”¹⁴² Fifty-eight power reactors generate over eighty percent of France’s electricity, with recycled nuclear fuel generating seventeen percent.¹⁴³ A spokesman for France’s national electricity utility company, Electricité de France, explained that reprocessing, compared to the direct storage of the spent nuclear waste, is “a process that reduces by a factor of 10 the volume of highly active long-lived waste.”¹⁴⁴

France’s reprocessing system involves converting spent plutonium and uranium into a “mixed oxide” that can be reused in nuclear power plants to produce more electricity.¹⁴⁵ France’s nuclear power plants ship the SNF to its recycling facility at Cap La Hague where it sits and cools down in demineralized water for three years. Afterward, the recycling process begins.¹⁴⁶ The nuclear material that cannot be recycled is imbedded in glass logs where it remains until the country creates an underground repository for storage.¹⁴⁷ It is important to note that a permanent repository is still necessary even if reprocessing begins in the United States, as some of the material cannot be recycled.

President Reagan ended the freeze on reprocessing in the U.S., but during this time the focus of SNF remained with building a repository.¹⁴⁸ Without an obstacle, the DOE created the Global Nuclear Energy Partnership (GNEP) in 2006.¹⁴⁹ The GNEP wanted to return nuclear energy on a larger scale by encouraging reprocessing.¹⁵⁰ A major part of the GNEP would have the U.S. reentering the uranium business by “joining with other reprocessing countries such as Russia, United Kingdom, France, and Japan to provide enriched uranium obtained through reprocessing to nations that want to develop commercial nuclear

141. Casey, *supra* note 9, at 763.

142. Katherine Ling, *Is the Solution to the U.S. Nuclear Waste Problem in France?*, N.Y. TIMES (May 18, 2009), <https://perma.cc/7Z73-J6SS> (last visited Nov. 12, 2017).

143. Farah, *supra* note 14, at 200.

144. Mycle Schneider & Yves Marignac, *Spent Nuclear Fuel Reprocessing in France*, INT’L PANEL ON FISSILE MATERIALS (Apr. 2008), <https://perma.cc/E9R2-CCLL> (last visited Jan. 21, 2018).

145. William Shughart, *Why Doesn’t U.S. Recycle Nuclear Fuel?*, FORBES (Oct. 1, 2014), <https://perma.cc/G6NW-EMQZ> (last visited Jan. 21, 2018).

146. *Id.*

147. *Id.*

148. Farah, *supra* note 14, at 194.

149. Stewart & Stewart, *supra* note 13, at 46.

150. *Id.*

power, without their having to construct either uranium enrichment or reprocessing facilities.”¹⁵¹ The Obama Administration ended funding for the GNEP, but the organization still meets as an international network without the full support of the United States.¹⁵²

Weapons proliferation is the primary concern with fuel reprocessing in the U.S.¹⁵³ The pure plutonium is separated from the spent fuel and is commonly used to create nuclear weapons.¹⁵⁴ In the post 9/11 world, terrorism is a concern. Skeptics believe that, if separated plutonium is shipped in commerce for reprocessing, terrorists could steal and potentially weaponize it.¹⁵⁵ In reality, terrorists would likely not make the plutonium into a bomb because they would be exposed to harmful radiation when opening the plutonium vessel.¹⁵⁶ A more likely scenario would be for terrorists to release the radioactive substance into the environment.¹⁵⁷ However, even this threat is fairly remote. There are no instances of terrorists obtaining spent nuclear fuel, mainly due to the substantial cost and technical difficulty of doing so along with the effective oversight by national governments and the International Atomic Energy Agency.¹⁵⁸

The U.S. should analyze what France spends on reprocessed fuel and try to remedy the problem before implementing it in practice. The U.S. can learn from France’s mistakes.¹⁵⁹ Even with the argument of cost, the environmental benefits are high. Recycling used fuel saves approximately twenty-five percent of natural uranium resources and reduces the volume of end waste by a factor of five and its toxicity by a factor of ten.¹⁶⁰ If Congress lifted the ban on nuclear fuel reprocessing, the U.S. could potentially cut the amount of nuclear waste requiring disposal by half.¹⁶¹ Advocates contend that reprocessing will provide “a plentiful, secure, long-term source of fuel for low-carbon nuclear power while significantly

151. *Id.*

152. *Id.* at 252.

153. *Id.* at 46.

154. A. David Rossin, *U.S. Policy on Spent Fuel Reprocessing: The Issues*, PBS ONLINE, <https://perma.cc/9D46-JL5F> (last visited Jan. 21, 2018).

155. *Id.*

156. *Id.*

157. *Id.*

158. Shughart, *supra* note 145.

159. Farah, *supra* note 14, at 204.

160. *The Advantages of Recycling*, AREVA, <https://perma.cc/3K48-92XZ> (last visited Jan. 21, 2018).

161. Shughart, *supra* note 145.

reducing the volume of, and formidable technical and political challenges posed by nuclear wastes requiring repository disposal.”¹⁶²

CONCLUSION

The United States must act to reduce the staggering amount of nuclear waste piling up around the country at nuclear plant sites. Congress should amend the NWPA to allow private facilities to begin accepting nuclear waste while the DOE decides the best option for a permanent nuclear repository. Although the government has spent a considerable amount of time and taxpayer money on Yucca Mountain, the environmental factors demonstrate that the longevity of the site is questionable. The DOE should move toward the consent-based approach of selecting a permanent repository. If the federal government offers incentives for states to hold the country’s nuclear waste, a solution that does not involve forcing nuclear waste on a particular state is possible.

By keeping the private interim facilities linked to a permanent repository, the country remains at a standstill with no options. The NWPA currently does not allow private facilities to operate without the licensing of a permanent repository. Amending the NWPA to permit the creation of interim storage facilities will allow the United States to finally tackle the growing nuclear waste.

While liability remains a concern for many states and potential private facilities, the Price Anderson Act could cover the facility from any damages that could possibly occur. A careful reading of the Act illustrates that private facilities are covered. The United States should also start a reprocessing program that mirrors France to deal with the nuclear waste crisis. If the United States begins a reprocessing program, the amount of nuclear waste would decrease and take up less space in a permanent repository. If the United States does not act soon, nuclear waste will remain the biggest threat to the safety of American citizens.

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162. Stewart & Stewart, *supra* note 13, at 46.

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